2012 Fire Weather Program Annual Summary

Covering Central and Northeast Oregon, South Central and Southeast Washington

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Cache Creek Fire near Enterprise, OR. Photo Credit: Rachel Trimarco – NWS Pendleton

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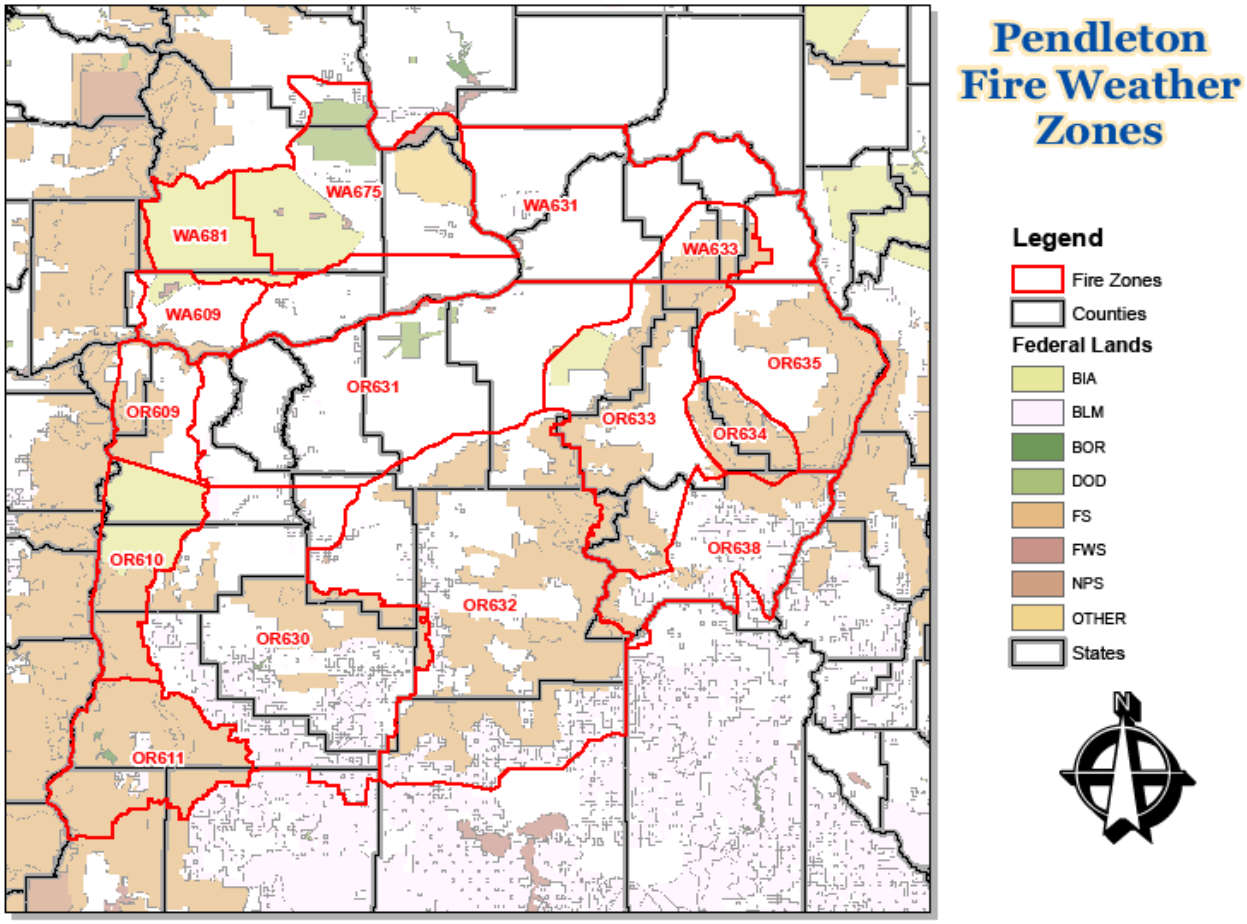
Fire Weather Zone Map with Federal Land Ownership



Fire Activity Summary

Fire season in the Pacific Northwest ramped up in July and August and peaked in September with approximately 1.6 million acres burned. The active fire season was in part due to the fact that there had not been widespread wetting rain since the middle of July. The warm and very dry conditions this summer lead to critically dry fuels that easily ignited, allowing fires to spread rapidly. Further exacerbating the situation, several strong wind events associated with dry cold fronts slowed firefighter efforts to contain the blazes. Over the course of the season there were several large fires in Pendleton's local forecast area that consumed nearly 200,000 acres of land and destroyed almost 300 structures.

Numerous thunderstorms with abundant lightning sparked several small grass fires through the first three weeks of July. However, these storms were also very wet with significant rainfall amounts that prohibited large wildland fires. Drier thunderstorms occurred the first week of August which started the Waterfalls 2 fire 5 miles northeast of Mt. Jefferson on the Warm Springs Reservation in Oregon. This fire burned 12,265 acres in high elevation timber and was not contained until September 15. The Geneva 12 grass fire also resulted from dry thunderstorms on August 6 on the Crooked River National Grasslands of Jefferson County, Oregon, but it was contained August 9 after only burning 1,337 acres.

On August 13 the Taylor Bridge fire began 4 miles southeast of Cle Elum, WA. This human caused fire spread rapidly to consume 23,500 acres as it was pushed by strong Kittitas Valley winds that at times exceeded 30 mph. Several evacuation orders were issued during this incident as the fire burned through a well-populated wildland-urban interface. Unfortunately, 272 structures were lost, which included many homes, with property damage estimated at $8.3 million.

Scattered thunderstorms the third week of August started two more wildfires in the local area. On August 19 the Diamond Butte fire began on the Yakama Nation Reservation in Washington and consumed 285 acres. The much larger Cache Creek fire then began on August 20 in the Hells Canyon National Recreation Area. This area adjacent to the Snake River on the Oregon/Washington border has very steep, rugged terrain and is prone to gusty afternoon winds. These conditions and the very dry weather that prevailed through the middle of the summer contributed to the fire growing to 73,697 acres before it was contained on September 26.
Other fires that occurred during the very dry period in August and September were the Parish Cabin fire 15 miles northeast of Seneca, OR, and the Highway 141 fire 2 miles north of White Salmon, WA. The causes of both of these fires are under investigation, but they were likely human caused. Parish Cabin was reported on August 28 and burned through 6,481 acres of the Malheur National Forest. Highway 141 began on September 5 on the east side of Washington State Highway 141 and burned 1,644 acres.

On September 8 a significant lightning storm brought over 3,000 strikes to eastern Washington igniting well over 100 fires. Just in Yakima and Kittitas Counties there were approximately 75 fires managed together as the Yakima Complex that burned 2,300 acres. There were also several fires farther north in the Okanogan-Wanatchee National Forest during this period, including the

Table Mountain fire near Cle Elum that charred 42,312 acres. Not only did these fires in the central Washington Cascades burn thousands of acres of land, but the smoke reduced air quality in and around the area through the beginning of October. Another large fire that caused notable air quality concerns was the Pole Creek fire which began September 9, and burned 26,795 acres 6 miles southwest of Sisters, OR in the Deschutes National Forest.

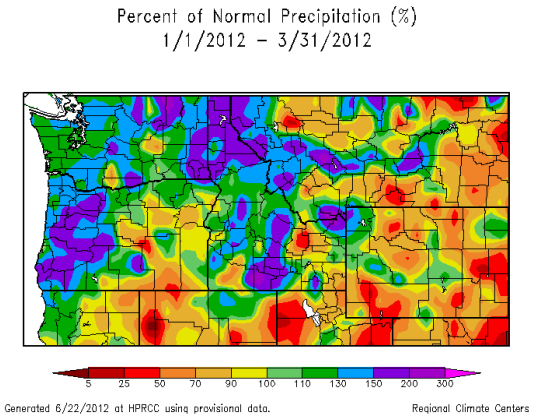
There were many other fires in other portions of the Pacific Northwest this year, but by the beginning of October the fire season was quickly winding down throughout the region as cooler weather returned. However, a widespread wetting rain did not finally occur until the middle of October when a series of low pressure systems brought several days of rain beginning October 13.

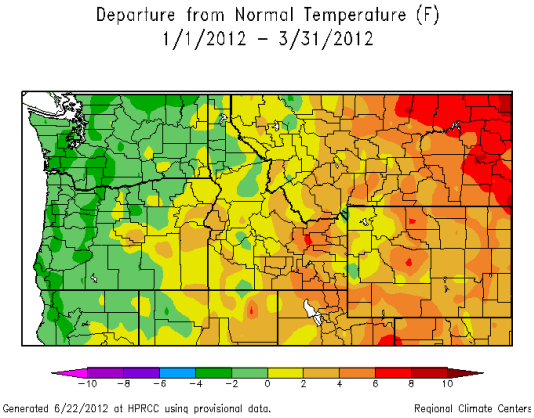
Left: Firefighters carry out burnout operations on the Waterfalls 2 Fire outside Warm Springs, OR. Photo Credit: Bob Mazrillo, Incident Management Team
Right: Taylor Bridge Fire near Ellensburg, WA. Photo Credit: Inciweb
Bottom: North Fork Wychus Creek on the Pole Creek Fire near Sisters, OR as seen by airplane. Photo Credit: Glenn Miller, Air Attack Supervisor on the fire

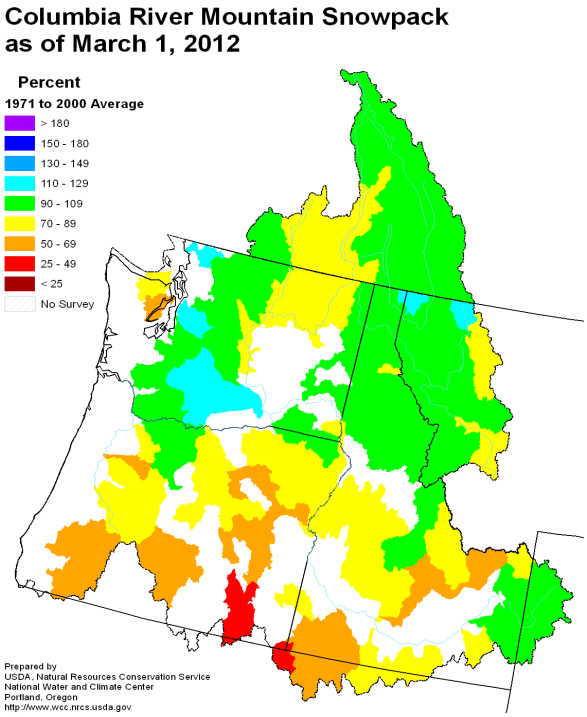
Weather Review

Winter (January – March)

Precipitation amounts were near to above normal across most of Northeast Oregon and Southeast Washington as several storm systems brought periods of heavy rain and snow. Yet, with a storm track aligned from southwest to northeast across the region, east central and southeast Oregon received below normal precipitation with temperatures slightly above normal. This left the winter snow pack near to above normal across much of Washington and in the Oregon Cascades, but below normal across the rest of Oregon for the period ending March 31. The following images illustrate conditions for the three-month period ending March 2012. Normal values for precipitation and temperature are from the 1981-2010 period of record.

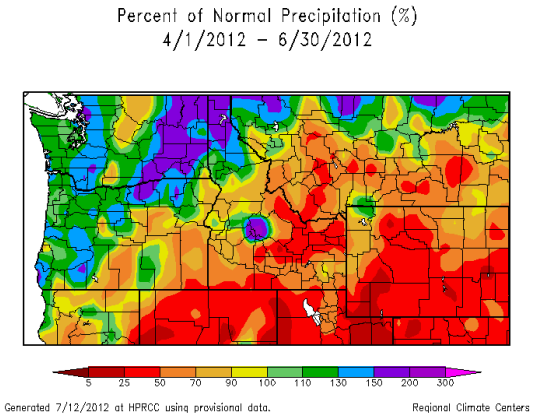


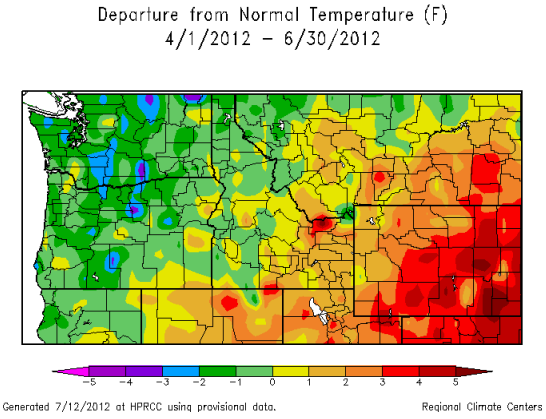


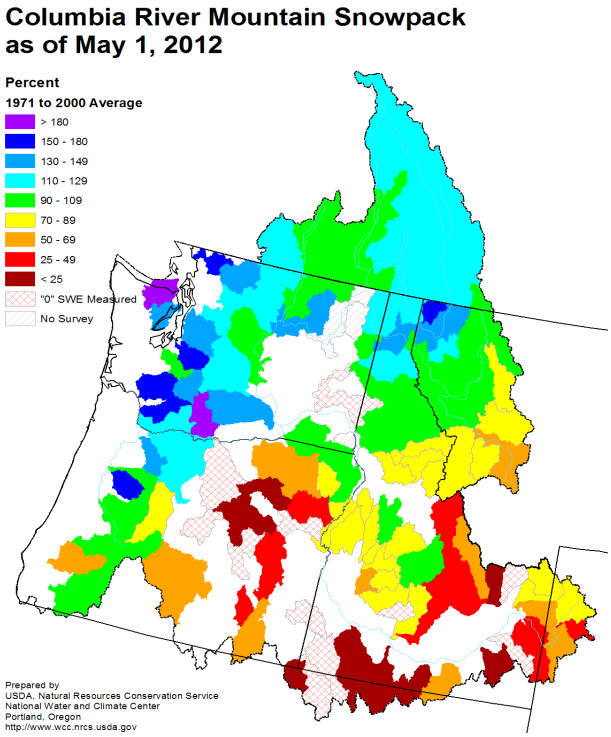


Spring Prescribed Burn Season (April – June)

For the fourth year in a row, the spring prescribed burn season was wet and cool under a very active weather pattern. However, due to the northerly storm track, it was quite a bit drier than last year across portions of Oregon, as can be seen in the unusually low snow levels. Prescribed burning therefore increased in these areas. There was also one small wildfire in the Deschutes National Forest in late April that required spot forecasts. Temperatures for the period were near to below normal, and although the final snowpack measurements occurred May 1, the cooler weather allowed the snowpack to persist through June, especially in the Cascades. It should be noted that several weather stations in northeast Oregon and southeast Washington received record rainfall in June.

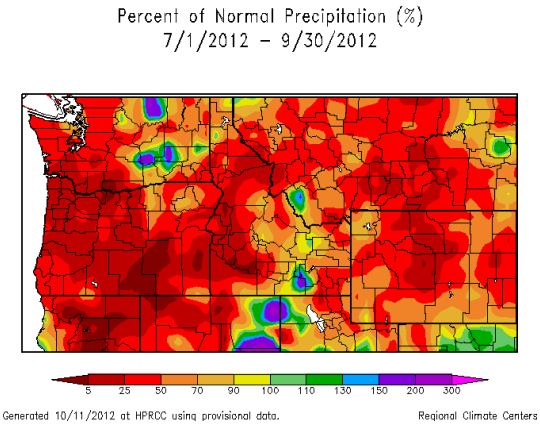


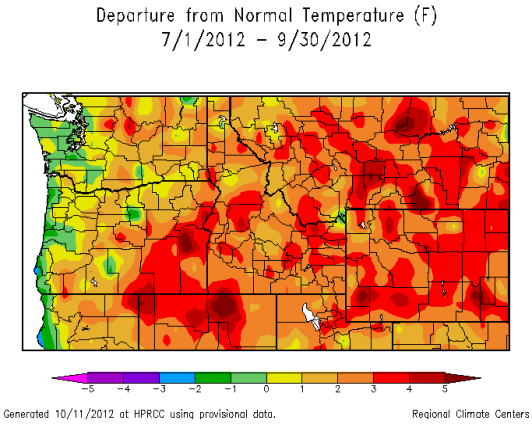




Summer Peak Fire Season (July – September)

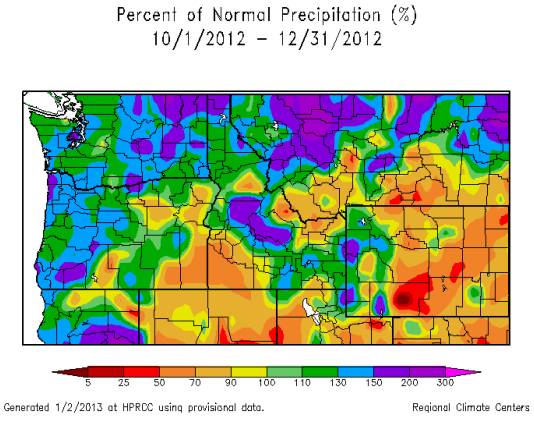
Enough drying occurred across the Pacific Northwest at the end of June and the beginning of July allowing the area to enter fire season by mid-July, only around two weeks later than typical. Several overnight low temperature records were set once again during the first week of July, but then high pressure during the second week caused many record high temperatures. This period was followed by several significant lightning events through the middle of the month, although abundant rainfall also occurred with many of these storms. High pressure then dominated the regions weather through much of August and September with above normal temperatures and much below normal precipitation. These conditions were occasionally interrupted by weather disturbances that brought dry thunderstorms and/or gusty winds. Several large wildfire complexes ignited during these two months that exhausted both local and national resources.

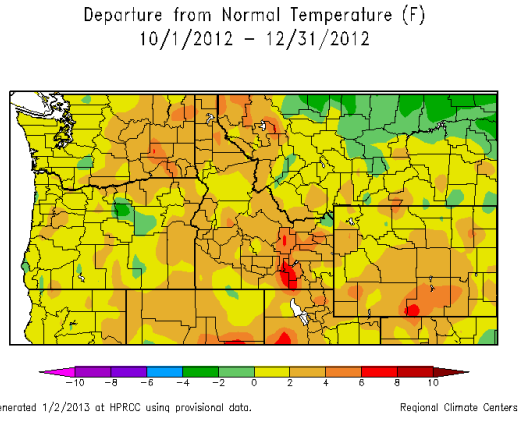




Fall Prescribed Burn Season (October – December)

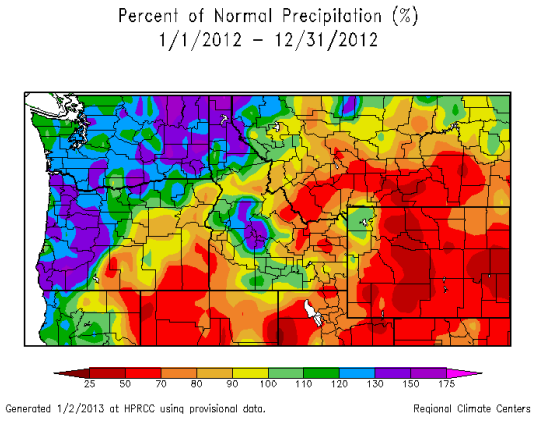
The region remained dry through the beginning of October, but by the middle of the month record breaking rainfall ended the dry spell. Many stations across the region reported 2012 in their top 5 longest periods without measurable rain. However, the abrupt rainy period that occurred during the second half of October also ensured that the fall prescribed burn season would be close to non-existent. Although high pressure and drier conditions returned by the beginning of November, a cold front during the second week of the month brought snow to local mountains, as well as central Oregon, effectively ended the fire season.

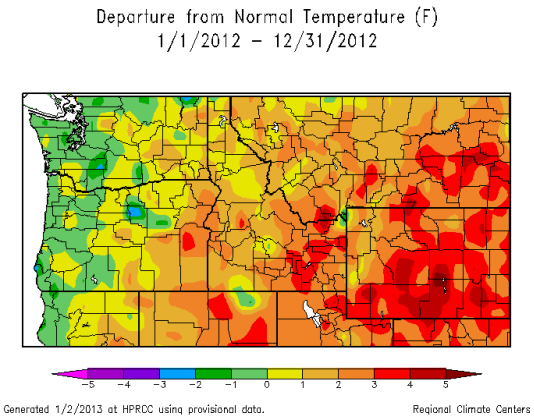




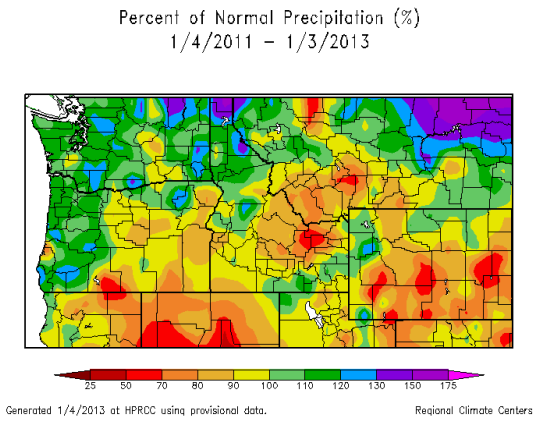
End of Year Conditions

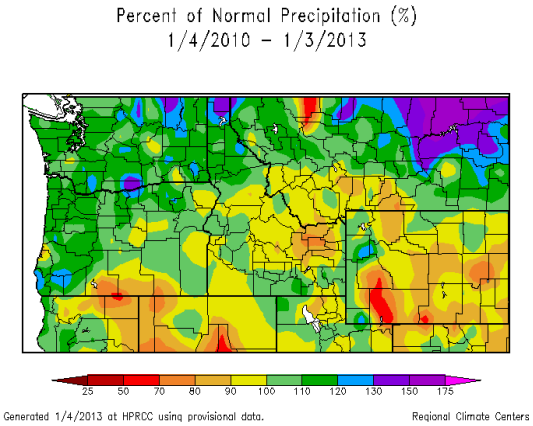
The images below provide a 12-month precipitation and temperature summary ending December 31, 2012. A very cool, moist spring gave way to a largely hot, dry period through the summer, followed by a moist fall. Overall, the persistent southwest flow over the area brought above normal precipitation to much of the region while southeast Oregon was far drier than normal. Temperatures over the past year averaged out to be near to only slightly above normal.





The cool and wet spring seasons over the last several years have yielded nearly average to above normal precipitation amounts as shown below. Because of this, NOAA's Climate Prediction Center considers the region under neutral long-term drought conditions, while portions of southeast Oregon range from abnormally dry to moderate drought conditions. Despite the dry period heading into 2013, if the trend indicated by the past few years holds, an increasingly wet and active pattern should once again develop at some point during the spring.





Number of Forecasts Issued

Month	Fire Weather Planning[1]	Spot Forecast			Red Flag Events		On Site IMET	NFDRS Forecasts	Air Transport & Stability[1]
		Prescribed	Wildfire	HAZMAT, Search/ Rescue, & Drill Support	Fire Weather Watch	Red Flag Warning			
Jan	0	1	0		0	0	0	0	31
Feb	0	2	0		0	0	0	0	32
Mar	10	4	0		0	0	0	6	31
Apr	43	32	2		0	0	0	29	30
May	54	99	0	2 (S/R)	0	0	0	30	31
Jun	62	9	9		0	0	12	29	30
Jul	63	2	34	2 (S/R) 1(D)	11	34	0	31	31
Aug	72	2	55	1 (D)	9	15	32	31	31
Sep	64	8	71		4	4	18	30	32
Oct	49	16	15		0	3	0	30	31
Nov	4	6	0		0	0	0	2	30
Dec	0	0	0		0	0	0	0	31
Total	**421**	**181**	**186**	**6**	**24**	**56**	**62**	**218**	**371**

[1] Includes non-routine forecast updates

Red Flag Warning Events and Verification

Date	Zones	Reason	Verification	Lead Time
July 8-10	All	Abundant Lightning	No – OR609, OR611, WA609, WA681 Yes – All others	32 hrs.
July 13-15	OR609, OR630, OR631, OR632, OR633, OR634, OR635, OR638, WA609, WA631, WA633, WA675, WA681	Abundant Lightning	Missed event – OR630 No – WA609 Yes – All others	10.72 hrs.
July 15-18	All	Abundant Lightning	Missed event – OR630 (Wildfire start after RFW was cancelled) No – OR609, OR610, OR611, WA609, WA681 Yes – All others	10.55 hrs.
August 5-6	All	Abundant Lightning	Yes – OR610, OR611, OR630 No – All others	29.53 hrs.
August 8	OR631, WA631, WA675	Wind/Low RH	Yes – All Zones	3.51 hrs.
August 17-18	OR610, OR611, OR630, OR632	Abundant Lightning	Yes – OR611 No – All others	28.02 hrs.
August 20-21	OR631, OR632, OR633, OR634, OR635, WA631, WA633, WA675	Abundant Lightning	No – OR632, OR634, OR635 Yes – All others	18.77 hrs.
August 23	OR631, WA631, WA675	Wind/Low RH	Yes – OR631, WA631 No – WA675	6.05 hrs.
August 26	OR630	Wind/Low RH	No	0.0 hrs.
August 28	OR638	Wind/Low RH	Missed event	0.0 hrs.
September 9-10	OR609, OR610, OR611, OR630, OR631, OR632, OR635, OR638, WA609, WA631, WA675	Wind/Low RH	Yes – OR611, OR631, WA631, WA675 No – All other	25.04 hrs.
September 21-22	All Zones	Abundant Lightning	No – All zones	0.0 hrs.

October 2	OR631, WA631, WA675	Wind/Low RH	Yes – All zones	26.06 hrs.
				Average: 18.00 hrs.

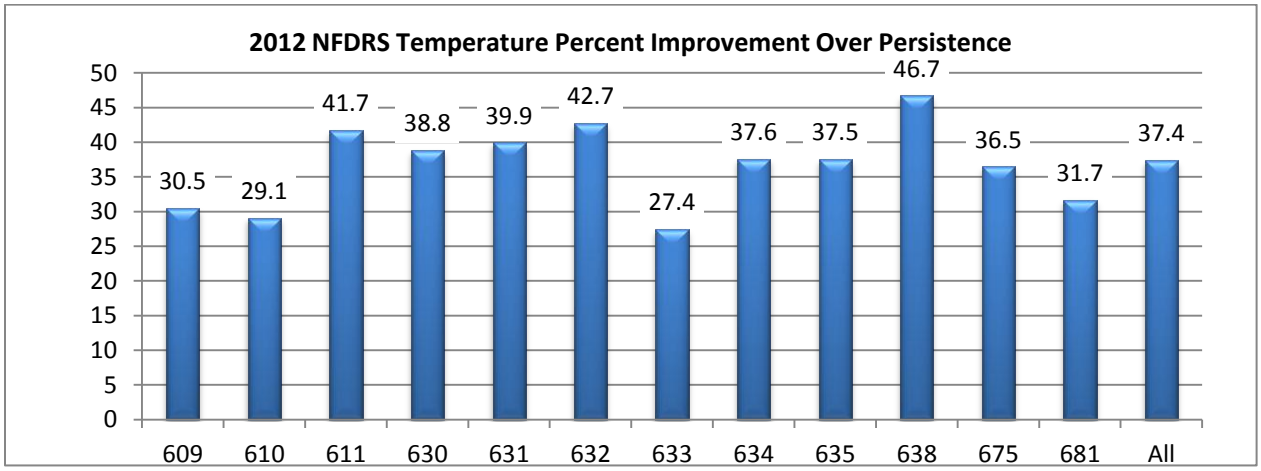
	All Warnings	Lightning	Synoptic (Low RH combined with Wind or Haines 6)
Warnings Issued:	105	84	21
Verified Warnings:	53	43	13
Unverified Warnings:	52	41	12
Missed Warnings:	3	2	1
Probability of Detection:	0.95	0.95	0.92
False Alarm Ratio:	0.50	0.51	0.43
Critical Success Index:	0.49	0.48	0.55

Note: For highest accuracy, False Alarm Rate (FAR) should approach 0.00 with Critical Success Index (CSI) and Probability of Detection (POD) nearing 1.00.

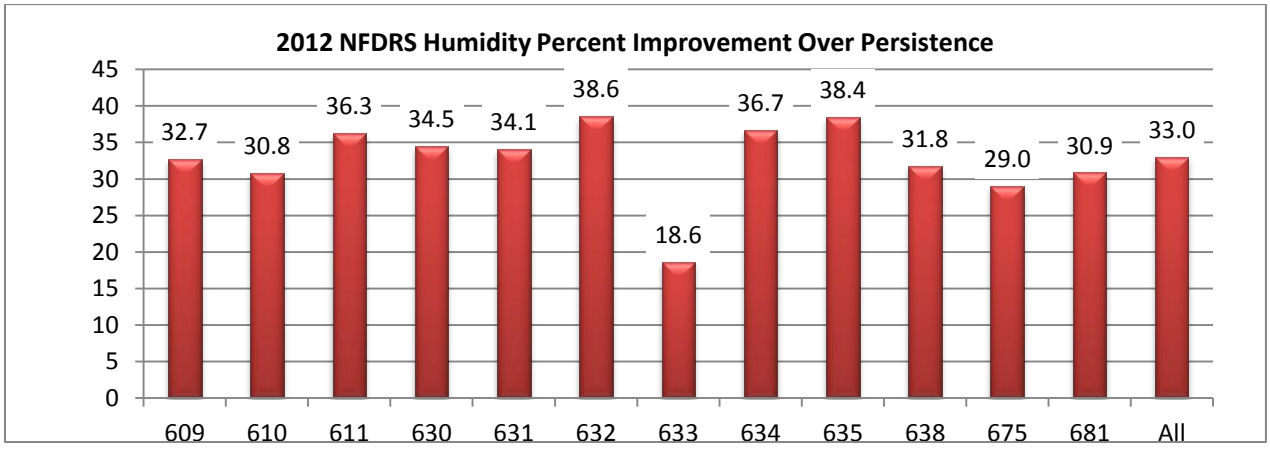
In 2012, as in 2011, this office placed a much higher emphasis on recognizing event potential and issuing warnings with greater advance notice (Lead Time) versus maintaining very low false alarm rates. The intent was to increase service to users by giving greater advance notice of a larger number of events. This approach resulted in improved Probability of Detection scores and longer Lead Times while False Alarm Ratio and Critical Success Index scores diminished as compared to previous years. Ideally, the number of False Alarms will not lead to user complacency from over warning and should trend downward over time as the window of marginal events narrows with continued experience.

National Fire Danger Rating System Forecast Verification

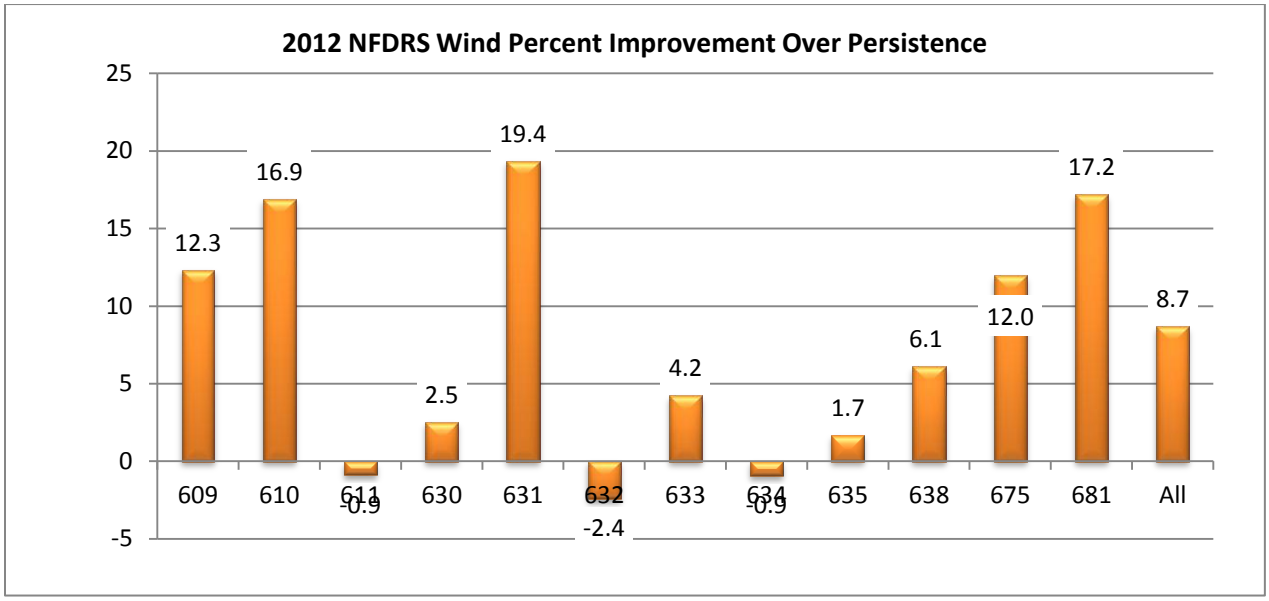
National Weather Service Offices provide input into the National Fire Danger Rating System via next day forecasts covering a variety of weather and weather related elements. Forecast comparisons against actual observations taken the following day at 1300 PST (1400 PDT) determine the amount of error with 1 point counted for each degree or mph of difference. The following charts show NWS Pendleton forecast percentage improvement over a persistence forecast for temperature, relative humidity, and wind speed averaged across each zone followed by the average of all stations in the final column. The June 1 through September 30 time frame is covered. Overall, numbers were down as compared to 2011 but were still above goals, except for wind improvement over persistence.



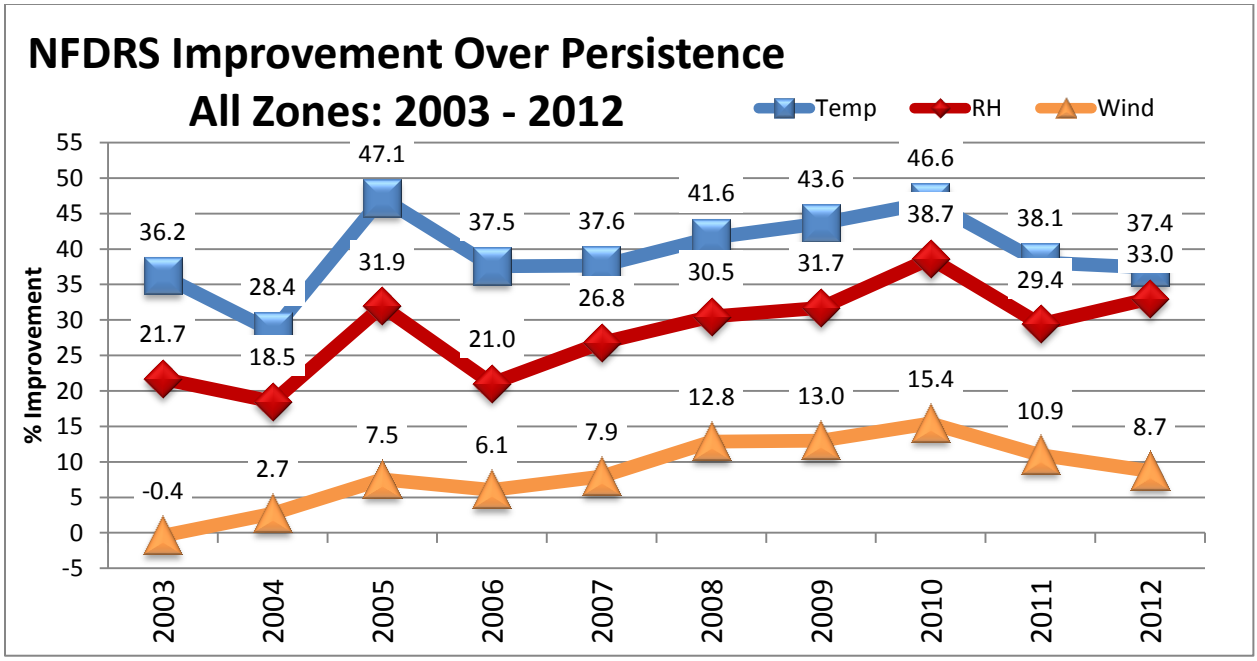
Temperature verification (above) for the entire Pendleton forecast fire area fell to 37.4% over persistence compared to 38.1% last year. The office goal is to maintain an improvement of 35% or greater which was accomplished in a majority of zones this year.



Humidity verification (above) rose to 33.0% over persistence this year compared to 29.4% last year. The office goal is to maintain an improvement of 25% or greater which was accomplished in all but three zones this year.

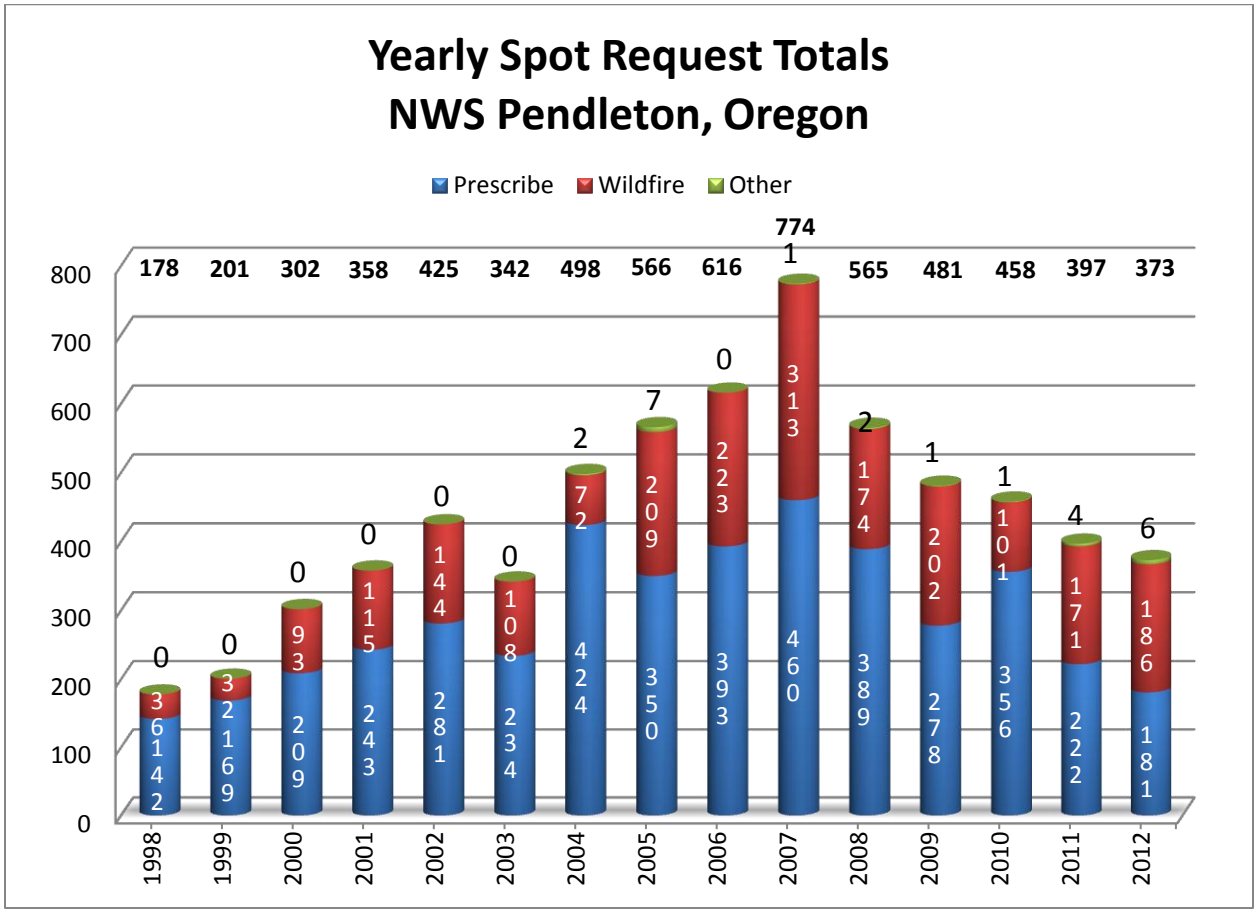


Overall wind verification (above) fell to 8.7% over persistence compared to last year's 10.9%. Our office goal is 10% improvement over persistence. This year saw a return to few big change wind events for mountain zones and thus typical difficulty of improving much over persistence.



10 year trend graph (above) showing forecast improvement over persistence for NFDRS forecasts. Overall, yearly NFDRS verification data and trends for the Pendleton office are showing a gradual improvement over persistence through 2010, but have trended downward over the past two years. Performance goals are improvements greater than 35% for temperature, 25% for relative humidity, and 10% for wind speed. Note: Technological improvements allowed NFDRS zone average trend forecasts to be switched to individual station trend forecasts in 2008.

Spot Forecast Totals



The chart above shows the 15-year trend of Spot forecasts issued by the Pendleton office. Total number of spot forecasts (373) issued by the Pendleton weather office this year continues the declining trend since a maximum of 774 in 2007. There were 181 prescribed burn spot forecasts (41 less than the previous year) and 186 wildfire spot requests (an increase of 15). There were two hazmat spots, two search and rescue, and two disaster drill forecasts this year.

IMET dispatches

Incident Meteorologists (IMET) provide on-site support for a variety of incidents where weather forecast and monitoring information is essential to emergency responder safety. Six IMET dispatches from NWS Pendleton occurred this year for a total of 72 days. Assignments are listed below.

Dates	IMET	Incident	Location
6/14 – 6/20	Trimarco (Trainee)	High Park	Fort Collins, CO
6/20 – 6/28	Trimarco (Trainee)	Russell's Camp	Douglas, WY
8/8 – 8/20	Trimarco	Springs	Garden Valley, ID
8/15 – 8/29	Solomon	Waterfalls 2	Warm Springs, OR
8/23 – 9/4	Trimarco	Cache Creek	Enterprise, OR
9/9 – 9/24	Solomon	Wesley	Riggins, ID

Training and Outreach Activity

Training and outreach continues to be an important part of the fire weather program at NWS Pendleton. Budget uncertainties reduced partner agency in-person visitation opportunities. The following table lists training and activities for 2012.

Date(s)	Forecaster	Activity	Location
1/22 – 1/26	Bonk/Trimarco	S-390 at Central Oregon Community College	Bend, OR
1/27	Bonk	S-390 Wallowa Whitman National Forest	LaGrande, OR
2/6	Bonk/Trimarco	Pendleton Air Quality Commission Meeting	Pendleton, OR
3/28	Solomon/Trimarco	IMET IT Training	Remote Conference
4/5 – 4/6	Trimarco	NWCC Meeting	Portland, OR
4/21 – 4/22	Trimarco	S-290 at Blue Mountain Community College	Pendleton, OR
4/23	All Staff	Annual Office Fire Weather Pre-Season Seminar	Pendleton, OR
4/25	Trimarco	RT-130 Training	Walla Walla, WA
5/2	Trimarco	Prescribed Fire Academy	Prineville, OR
5/7 – 5/8	Trimarco	S-390 at Warm Springs Indian Reservation	Warm Springs, OR
5/15	Solomon	RT-130 Training	Pendleton, OR
5/24	Trimarco	Columbia Plateau Pre-season Workshop	Hermiston, OR
6/5	Trimarco	Drill Spot Forecast for Columbia Generating Station Exercise	Benton County, WA
8/18	Trimarco	Drill Spot Forecast for Columbia Generating Station Exercise	Benton County, WA